

1 1. An exciter assembly for supplying power to a superconducting load disposed
2 within a cryogenic region of a rotating machine, the exciter assembly comprising:

3 a transformer having a primary winding and a secondary winding, one of the primary
4 and secondary windings being positioned in a rotational reference frame relative to the other
5 of the primary and secondary windings; and

6 a rotatable enclosure including a wall having an intermediate core formed of a high
7 permeability material, the intermediate core positioned between the primary winding of the
8 transformer and the secondary winding of the transformer.

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1 2. The exciter assembly of claim 1 wherein the primary winding is disposed
2 external to the rotatable enclosure and the secondary winding is disposed within the rotatable
3 enclosure.

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1 3. The exciter assembly of claim 1 wherein the primary winding is in the form of
2 a stationary disk and the secondary winding is in the form of a rotatable disk axially spaced
3 from the stationary disk to form a gap therebetween, the wall of the rotatable enclosure
4 disposed within the gap.

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1 4. The exciter assembly of claim 3 wherein at least one of the stationary disk and
2 the rotatable disk is formed of radial laminations.

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1 5. The exciter assembly of claim 4 wherein the intermediate core is formed of
2 radial laminations.

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1 6. The exciter assembly of claim 3 wherein the stationary disk and the rotatable
2 disk are each formed of core segments, each core segment on each of the stationary disk and
3 rotational disk disposed in a radial direction and angularly spaced from another core segment
4 of the stationary disk and rotational disk, respectively.

1 7. The exciter assembly of claim 6 wherein the intermediate core is formed of
2 core segments, each core segment on the intermediate core disposed in a radial direction and
3 angularly spaced from another core segment of the intermediate core.

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1 8. A rotatable enclosure surrounding a housing having an internal volume for
2 supporting cryogenically-cooled components, the rotatable enclosure comprising a wall
3 including a flux window formed of a high permeability material, the flux window positioned
4 between a primary of a transformer disposed external to the rotatable enclosure and a
5 secondary of the transformer disposed within the rotatable enclosure.

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